

# (12) UK Patent Application (19) GB (11) 2 136 407 A

(43) Application published 19 Sep 1984

(21) Application No 8406451

(22) Date of filing 12 Mar 1984

(30) Priority data

(31) 8306882 (32) 12 Mar 1983 (33) GB

(51) INT CL<sup>3</sup>  
B65D 88/64

(52) Domestic classification  
B8S AS

(56) Documents cited

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GB 1385734	GB 1117648
GB 1305149	EP A1 0064242

(58) Field of search  
B8S

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## (54) Preventing bridging in hoppers

(57) A meal-holding container (8) has, arranged within its hollow lower end (10) of frusto-conical shape, a device comprising one or more partitions (12), e.g. of frusto-conical form, to compartment the interior of said lower end thereby to prevent bridging of meal on gravitational flow thereof through the outlet (11) at the open bottom of the lower end (10). The compartments each communicate at their lower end with said outlet (11). The partition (12) may be suspended by chains, wire ropes or like elements (20) or can be fixed in position by webs (13). The partition can alternatively be formed of radially-extending walls 15 (Fig. 3b).

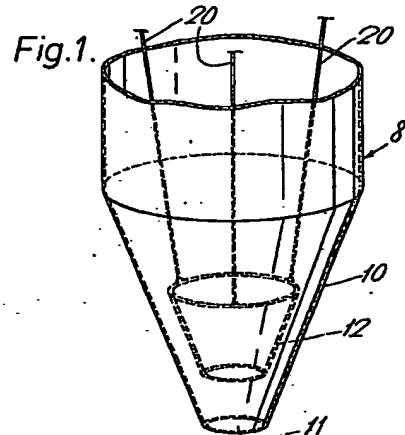
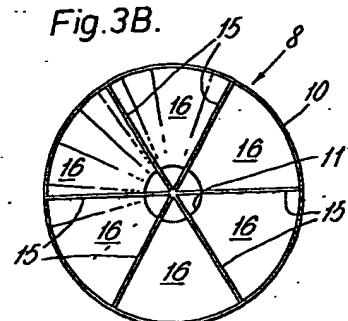


Fig. 1.



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Fig.1.

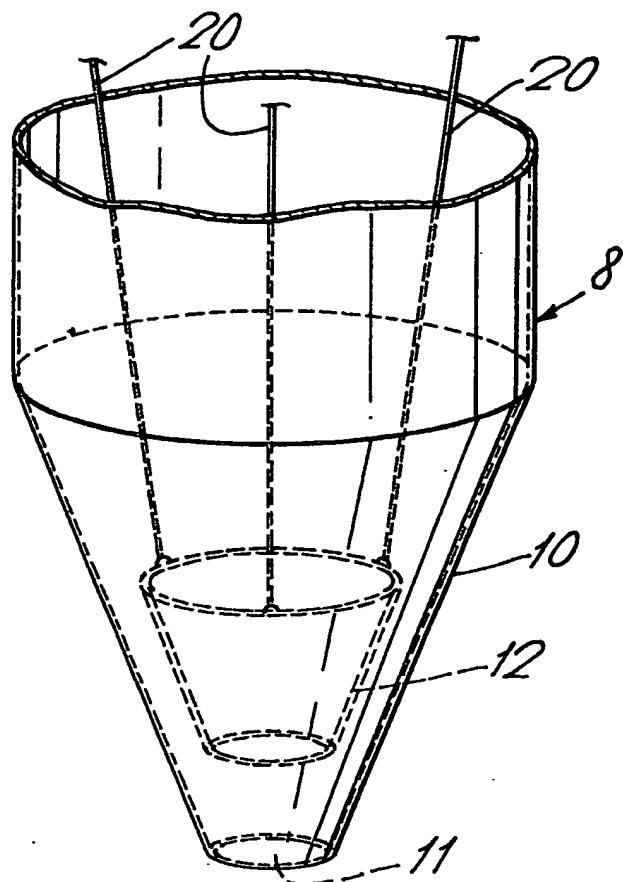
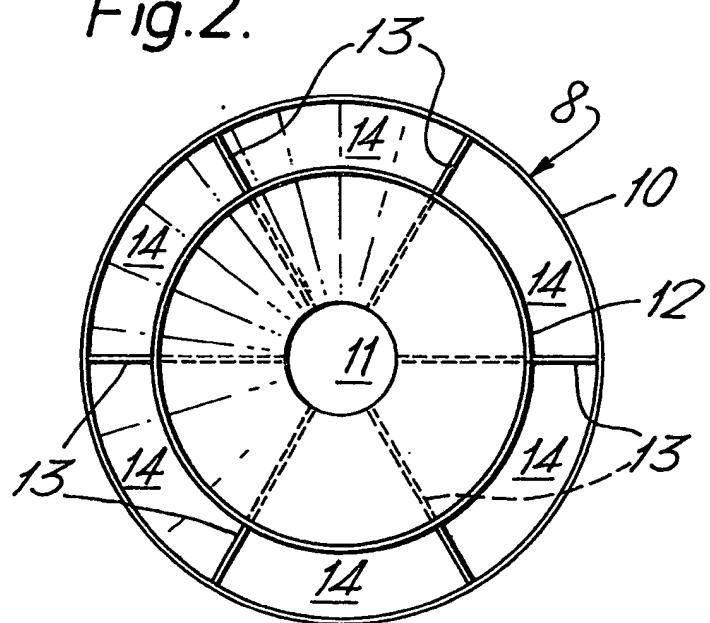


Fig.2.



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Fig.3A.

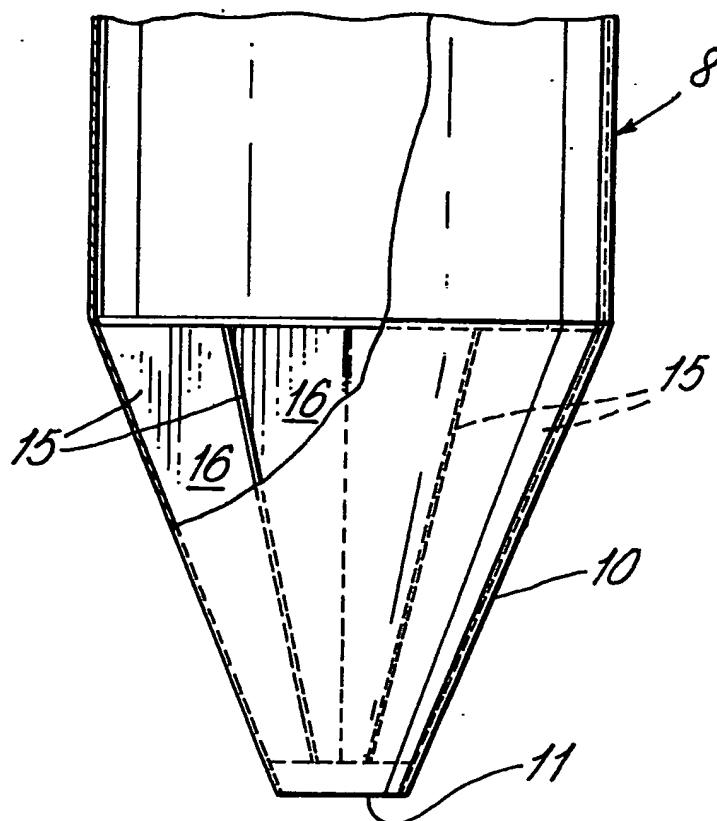
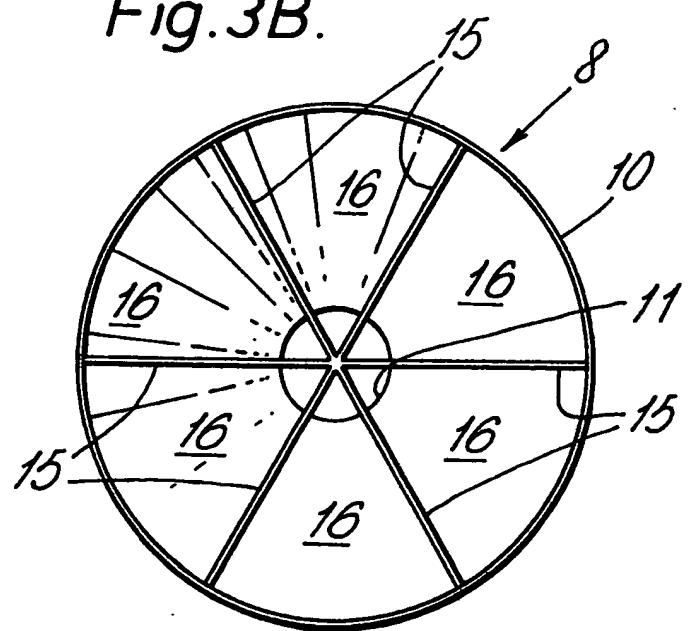


Fig.3B.



**SPECIFICATION****Method of preventing bridging of in meal-holding containers**

This invention relates to a method of preventing bridging of meal as it flows to discharge under gravity through the hollow lower end of a meal holding container, such as a silo. Meal is free running under gravity but because of compressive forces which must additionally be taken into consideration when it is flowing under gravity through the hollow lower end of inverted frustoconical shape of a meal holding container, it tends to migrate in various directions and open up flow passages readily followed by trailing particles. This tendency is known in the art as a tendency to "bridge" and the verb "bridge" and its derivatives are to be construed in the sense where used herein.

In accordance with the present invention, a method of preventing bridging of meal, as it flows to discharge under gravity through the outlet at the open bottom of the hollow lower end of a meal-holding container of inverted frusto-conical shape, comprises arranging within said lower end, a device comprising one or more partitions to compartment the interior of said lower end, the compartments each communicating with said outlet.

Further in accordance with the present invention, a meal-holding container has arranged within its hollow lower end of frusto-conical shape, a device adapted to prevent bridging of meal on gravitational flow thereof through an outlet at the open bottom of the hollow lower end of the container, said device comprising one or more partitions to compartment the interior of said lower ends, the compartments each communicating with said outlet.

Preferably, one partition is provided of hollow inverted frusto-conical shape whose base is arranged concentrically with the hollow lower end of the inverted frusto-conical shape, and means are provided to support said partition in location.

Alternatively, two or more partitions are provided each of hollow inverted frusto-conical shape and the bases of which have progressively smaller diameters and all arranged with their bases concentrically with one another and with the hollow lower end of inverted frusto-conical shape of said container, and means are provided to support said partitions in location.

Further alternatively, the partition is a fabrication of intersecting plates whose outer edges lie against the inside of the hollow frusto-conical lower portion so as to compartment the interior thereof into segmental units.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

60 Fig. 1 is a diagrammatic perspective view of a hollow lower end of inverted frusto-conical shape of a meal-holding container having an anti-bridging device mounted therein according to a first embodiment of the present invention.

65 Fig. 2 is a diagrammatic plan view of the hollow lower end of inverted frusto-conical shape of a meal-holding container having an anti-bridging device according to a second embodiment of the present invention; and

70 Figs. 3A and 3B are diagrammatic side and plan views respectively of an anti-bridging device according to a third embodiment of the present invention, the device being shown in a similar position as in Fig. 2.

75 Referring to the drawings, an anti-bridging device is located in a hollow lower end 10 of an inverted frusto-conical shape of a meal-holding container 8. The open bottom of the lower end 10 defines an outlet 11. The device, in general, has 80 one of more partitions to compartment the interior of said lower end 10.

In a first embodiment (Fig. 1), one partition 12 is provided of hollow inverted frusto-conical shape whose base is of smaller diameter than the base of 85 the lower end 10 and both bases are arranged concentrically one with the other but spaced vertically apart, with the frusto-conical walls parallel or slightly diverging towards the outlet.

The open bottom of the partition 12 is of the same 90 or slightly smaller diameter as the outlet 11 of the lower end 10 and is spaced vertically thereabove to communicate therewith. The partition 12 is supported from chains, wire ropes or other elements 20 from anchorages (not shown) 95 provided internally of the container 8.

In a modification of the first embodiment (not shown) two or three hollow inverted frusto-conical partitions are provided, the bases of which have progressively smaller diameters and are arranged

100 concentrically with one another, the sides of each being parallel with each other or having sides which diverge slightly with each other towards the outlet, the open bottoms of the partitions all being of the same diameter or of progressively smaller 105 diameter and all being located vertically one above the other, the partitions each being supported independently of the other by chains or other elements.

In the second embodiment as shown in Fig. 2, a partition 12 is provided as in Fig. 1 however the annular gap defined between the walls of the lower portion 10 and the wall of the partition 12 is divided into six equal segmental units 14 by six equi-space webs 13.

115 In the modification of the first embodiment in which two or three partitions are provided, webs can be provided between each adjacent partition to support each from the other.

In the third embodiment (Figs. 3A and 3B), the 120 partition is a fabrication of six equi-spaced intersecting plates 15 of similar truncated right-angled triangular shape radiating outwardly from their intersection, the outer edges of hypotenuses of the plates 15 lying against the inside or the hollow frusto-conical lower end 10 so as to compartment the interior thereof into segmental units 16. The plates 15 can be welded together

125 along contiguous sides or a tubular hub can be provided to which the plates 15 can be secured to

radiate therefrom. The fabrication terminates short of the outlet 11.

In use, meal fed into a meal-holding container 8 passes into the interior of the lower end 10 and is held in the separate compartments defined by the partitions. When the outlet 11 is opened, meal is anticipated to flow quite freely out of the container.

The curved wall of the or each partition 12 may 10 be of quasi-conical shape, for example six-sided.

#### CLAIMS

1. A method of preventing bridging of meal, as it flows to discharge under gravity through the outlet at the open bottom of the hollow lower end of a 15 meal-holding container of inverted frusto-conical shape, comprises arranging within said lower end, a device comprising one or more partitions to compartment the interior of said lower end, the compartments each communicating with said 20 outlet.
2. A meal-holding container having arranged within its hollow lower end of frusto-conical shape a device adapted to prevent bridging of meal on gravitational flow thereof through the outlet at the 25 open bottom of the hollow lower end of the container, said device comprising one or more partitions to compartment the interior of said lower end, the compartments each communicating with said outlet.
3. A container as claimed in Claim 2, wherein 30 one partition is provided of hollow inverted frusto-

conical shape whose base is arranged concentrically with the hollow lower end of the inverted frusto-conical shape, and means are provided to support said partition in location.

4. A container as claimed in Claim 2, wherein two or more partitions are provided each of hollow inverted frusto-conical shape, the bases of which have progressively small diameters and are all 40 arranged with their bases concentrically with one another and with the hollow lower end of the inverted frusto-conical shape of said container, and means are provided to support said partitions in location.
5. A container as claimed in Claim 2, wherein the partition is a fabrication of intersecting plates whose outer edges lie against the inside of the hollow frusto-conical lower portion so as to compartment the interior thereof into segmental 50 units.
6. Method of preventing bridging of meal in a meal-holding container substantially as hereinbefore described with reference to the accompanying drawings.
7. A meal-holding container substantially as hereinbefore described with reference to Fig. 1 of the accompanying drawings.
8. A meal-holding container substantially as hereinbefore described with reference to Fig. 2 of the accompanying drawings.
9. A meal-holding container substantially as hereinbefore described with reference to Figs. 3A and 3B of the accompanying drawings.